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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,503	03/10/2004	Glen R. Fox	TI-37151	4009
23494	7590	12/02/2004	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			SEFER, AHMED N	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/797,503

Applicant(s)

FOX ET AL.

Examiner

A. Sefer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 October 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I (claims 1-27) in the reply filed on 10/25/04 is acknowledged.

### ***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: There is insufficient antecedent basis for "the semiconductor body" recited in claim 15.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 7 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Inman et al. ("Inman") USPN 5,155,658.

Inman discloses in figs. 1-10 a semiconductor device, comprising a ferroelectric capacitor comprising a conductive lower electrode material 10 formed above a semiconductor body; a ferroelectric material 14 comprising PZT (as in claim 2) comprising a Zr content within the range recited in the claim (as in claims 7 and 8) formed above the lower electrode material, the ferroelectric material individually comprising an elongated dimension, wherein a percentage of the unit cells are oriented with elongated dimensions substantially normal to a generally planar

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upper surface of the semiconductor body, and wherein the percentage is within the range recited in the claim (col. 3, lines 15-32); and a conductive upper electrode material 16 formed above the ferroelectric material.

5. Claims 15, 16, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Inman.

Inman discloses in figs. 1-10 a ferroelectric capacitor comprising a conductive lower electrode material 10 formed above a semiconductor body; a ferroelectric material 14 comprising PZT (as in claim 16) comprising a Zr content within the range recited in the claim (as in claims 21 and 22) formed above the lower electrode material, the ferroelectric material comprising unit cells individually comprising an elongated dimension; and a conductive upper electrode material 16 formed above the ferroelectric material; wherein the upper and lower electrodes are spaced from one another along an axis, wherein a percentage of the unit cells in the ferroelectric material are oriented with elongated dimensions substantially parallel to the axis, and wherein the percentage within the range recited in the claim (col. 3, lines 15-32).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3-6, 9-14, 17-20 and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inman in view of Natori US PG-Pub 2004/0173826/ Sumi (JP 2003-133604).

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Inman discloses the device structure as recited in the claim, but does not specifically disclose a lower electrode comprising Iridium.

Natori discloses (figs. 2, 7-12 and pars. 0067 and 0069) a ferroelectric capacitor comprising a conductive lower electrode material 312/112 comprising Iridium (as in claims 4, 10, 12, 18, 24 and 26) formed above a semiconductor body; a ferroelectric material 114 comprising PZT; and a conductive upper electrode material 116 formed above the ferroelectric material.

Similarly, Sumi discloses (fig. 3 and abstract) a ferroelectric capacitor comprising a conductive lower electrode material 42 comprising Iridium formed above a semiconductor body; a ferroelectric material 43 comprising PZT; and a conductive upper electrode material 44 formed above the ferroelectric material.

Since Inman, Natori and Sumi are all from the same field of endeavor, ferroelectric capacitors; the teaching disclosed by Natori/Sumi would have been recognized in the pertinent art of Inman. Therefore, it would have been obvious to one skilled in the art the time the invention was made to modify Inman's device by incorporating a lower electrode comprising Iridium since that would provide a high reliability ferroelectric capacitor.

As for claims 3, 5, 6, 9, 11, 13, 14, 17, 19, 20, 23, 25 and 27, it would have been obvious to meet the recited working ranges since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. Furthermore, the specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or

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upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915.

**NATHAN J. FLYNN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANS  
November 22, 2004